2016

Academic Learning Compact : Biology [Effective 2016]

University of South Florida St. Petersburg.

"… to ensure student achievement in undergraduate and graduate degree programs …"

Academic Learning Compacts
BIOLOGY

Fall 2016 – Spring 2017
Due: May 19, 2017

Academic Program-linked College Mission-based Goals/Objectives

In the matrix on the following page, please place an X in the grid that identifies the degree program goals and objectives that align with the institutional mission-based goals/objectives and the College based goals/objectives. These goals/objectives need to be documented in your ALC data.

"… to ensure student achievement in undergraduate and graduate degree programs …"

UNIVERSITY OF SOUTH FLORIDA ST. PETERSBURG GOALS & OBJECTIVES		COLLEGE OF ARTS & SCIENCES GOALS & OBJECTIVES	*UNDERGRADUATE PROGRAMS*										
			Anthropology	Biology	Criminology	Literature & Writing	Environmental Science (BA)	Graphic Design	Political Science	Psychology	History	I.S.S.	journalism (BA)
Academic Performance	**Use sustained evidence of SLO's and student achievement for continuous improvement**	**Initiate and expand graduate programs and develop formal academic ties to other graduate programs within the USF system**		X									
	Offer certificate, undergraduate and graduate programs that meet regional needs			X									
	Implement and support information and instructional technologies that facilitate effective pedagogies			X									
	Enhance programs that specifically support academic excellence			X									
	Increase student awareness of participating in a global society			X									
Student Engagement	**Create a freshman experience that enables students to thrive and move successfully through to graduation**	**Our students will have critical skills and a broad outlook that will make them engaged and productive citizens** **Incorporate civic engagement, service learning, and experiential learning into their classes, when appropriate**											
	Foster institutional pride and strengthen connections within the campus community			X									
	Enhance opportunities for increased student involvement in curricular and co-curricular activities			X									
Diversity & Inclusion	**Insure an inclusive community where differences are respected and valued**	**Cultivate a vigorous liberal arts culture by recruiting talented diverse students, maintaining small class sizes, and mentoring those students we have.** **Encourage free discussion, foster critical thinking, demand that our students write, and work across disciplines**		X									
	Attract and retain a diverse student population			X									
	Increase the diversity of faculty and staff			X									
Research & Creative Activities	**Create a vibrant culture of faculty research and creative scholarship**	**Make significant and meaningful contributions to ongoing dialogues in our academic fields.** **We expect our undergraduate and graduate students to engage in research in collaboration with faculty**		X									
	Promote and support undergraduate research as a meaningful aspect of campus life			X									
	Enhance and support research and scholarly collaborations with community partners			X									

Academic Learning Compacts: Fall 2016 – Spring 2017

"… to ensure student achievement in undergraduate and graduate degree programs …"

Signature Page for Academic Program

Academic Program: BIOLOGY

Chair/Coordinator: Melanie Riedinger-Whitmore Date: May 2017

Summary Statement – Academic Program Performance in Fall 2016 & Spring 2017

Provide a summary statement about academic program performance over the previous year including high points and low points.

Our Biology program, which was started Fall 2012, continues to grow, and we remain the largest major in the college. By the end of the term, we had more than 760 Biology majors. Our student body is large and diverse, and includes a large number of transfer students. The results for our ALCS are similar to what we reported in previous years: Our results are generally positive for those ALCs we were able to measure. As in past years, our students understand key concepts in biology, they are developing critical thinking and writing skills, and many of our junior/seniors are completing original research projects or internships. Our students are active in student organizations, especially as the number of organizations grows on campus. Our students continue to be involved in community outreach, though we have only been able to collect limited information, primarily anecdotal on some activities. Our premed and prevet clubs are active, with our prevet club attending national meetings and serving in leadership roles. We also have of Computational Biology club that is active in research, with presentations at conferences, and they recently worked with UCF in establishing a SE regional student group for the International Society of Computational Biology. We know that our students are active in other clubs on campus, but have not formally measured their activity. Collecting data on trends continues to be somewhat problematic, for a number of reasons. We streamlined our ALCs and focal courses for the last academic period (2015-2016) so that we could target data collection to core course experiences. We were able to collect data for most of our core courses, with the exception of BSC 2011. The course coordinator, a visiting faculty member, accepted another position that started in spring, and we did not request ALC information before he left, and in spring, other faculty teaching sections of that course didn't submit data. We are still limited by the number of regular faculty we have (9 regular Biology faculty + 2 visiting professors, and many of our courses are taught by adjuncts or graduate students from other programs. Some of our ALC goals weren't measured in part because many of our adjuncts weren't informed about the ALCs or the assignments tied to them, because they realized too late that the data was needed, or because they structured assignments in ways that did not lend themselves to data collection for our ALCs. As we continue to increase the number of sections of some of our courses we are offering, it often makes it difficult to coordinate ALC data collection as well as the required lab/lecture exercises, especially when we have many new adjuncts or TAs to train. We now have course coordinators for many of our core sections, and starting in fall, we'll have our own graduate program, with graduate students serving as TAs for many lab sections. The timeline for setting academic year ALCs is shifting to the start of fall classes, rather than the end of spring semester, which will hopefully allow us to better coordinate setting ALCs for the next year, and agreeing on assignments to assess the ALCs. . Some of our core courses in past, were coordinated by part-time faculty, who weren't available to participate in departmental dialogues regarding program goals. We anticipate that data collection will be more manageable in the coming year. As we approach year the next year our program, we will begin looking at this data in preparation for program review in 2018-2019.

Summary Statement – Impact of Changes Made in 2016- 2017

Provide a summary statement about changes that were made in your program as a result of ongoing assessment in the preceding year. Please include both the positive and negative impact of the changes.

Our students continue to express interest in a diversity of elective courses, and the courses that we added last year (Immunology, Disease Ecology, Plant Taxonomy, Vertebrate Zoology, Herpetology, Wild Vertebrates of Florida) were well received, with good enrollment. Our dialogue, regarding key concepts that we feel needs to be covered in our program continues, but we have not implemented a final list of topics, nor suggested exercises, and it continues as a topic dealt with informally. In fall, we're scheduled to assemble as a department to discuss the ALCs for 2017-2018, and we will revisit this topic then, as a group. In recent years, we've included required courses as part of our concentrations, and it might be appropriate to begin including ALCs for those courses in future. Last year, we began circulating primary literature on math and biology education issues among our broader faculty, and this has helped maintain a dialogue, especially regarding assessment and grading. We have a draft document that some faculty are using to standardize expectations for internships, etc. and the college now has an Internship coordinator who will help with placement and outreach. Last year, we stopped offering a Scientific Writing course. Several faculty have added additional writing components to compensate for the deletion of this course from our program. We have not yet had a chance to assess the impact of this on our students' writing skills. We added two new faculty members in Fall 2016 who are responsible for teaching cell biology and coordinating cell biology labs, which is adding more consistency to the offering of that core course. They are also offering more elective options for our biomedical sciences concentration. We've also hired a laboratory manager to oversee the setup and running of the teaching labs. This actually started to free up some faculty time commitments to prep labs in spring, and also will allow us to explore more complicated lab setups that required additional time for prep, etc. We continue to rely heavily on temporary faculty, and this continues to impact our ability to uniformly assess ALCs and collect data. We've been fortunate that we've attracted very dedicated adjuncts to supplement our regular faculty, but it still presents somewhat of a problem for setting standards for assessment/measurement. As faculty become more comfortable in their roles as course coordinators, hopefully we can better communicate ALC goals and outcomes, and their assessment, and get them set into syllabi before the beginning of each semester.

Academic Program: Biology
Person Responsible: Melanie Riedinger-Whitmore, Chairperson, Department of Biological Sciences

Mission of Academic Program (include URL):
The Biology curriculum is designed to provide students with a strong foundation in the Biological Sciences, to introduce students to standard research methods in Biology, and to help them develop critical thinking skills as well as competency in scientific writing and quantitative analysis. Our degree prepares students for professional schools (medicine, dentistry, veterinary medicine, pharmacology, physical therapy), graduate programs in the life sciences (botany, animal behavior, cell biology, ecology, zoology, microbiology, marine biology, molecular biology, biomedicine, biotechnology), and other STEM-related fields that require a strong background in Biology. Students majoring in Biology complete core course work in cell biology, ecology, evolution, and genetics, can select elective courses from five areas of emphasis: a) Biomedical Sciences, b) Marine Biology, and c) Ecology and Evolution, d) Plant Biology, and e) General Biology, where students can also tailor their elective course choices to satisfy their individual academic or research interests. Undergraduate research experience is one of the capstone options for this degree, and students are provided many opportunities to work closely with Biology faculty on field or laboratory-based research projects. Internship opportunities, another capstone option, are available for Biology majors through local state and federal government agencies, nonprofit groups, and at biomedical facilities adjacent to the USFSP campus. The mission of our program is to provide our students with a strong foundation in Biology, and the technical and research skills that will allow them to succeed in a wide variety of biological science careers.
https://www.usfsp.edu/biology/

List Program Goal(s) / Objective(s):
Program Goals / Objectives must be mapped to College Goals / Objectives – use consistent nomenclature.
[Please note impact of any changes that were made as a result of 2009-10 assessment]

The Biology program began in Fall 2012, and within the first semester attracted over 550 Biology majors. By Fall 2015, the program had more than 760 majors. Since we are truly establishing the foundation for this degree, we have decided to base our goals/objectives on the recent American Association for the Advancement of Science "Vision and Change in Undergraduate Biology Education: A Call to Action - Final Report 2011 (http://visionandchange.org/files/2011/03/Revised-Vision-and-Change-Final-Report.pdf; http://visionandchange.org/; The goals/objectives recommended by AAAS, and which we follow are quoted below:

1. **Integrate core concepts and competencies throughout the curriculum**
   Introduce the scientific process to students early, and integrate it into all undergraduate biology courses. Define learning goals so that they focus on teaching students the core concepts, and align assessments so that they assess the students' understanding of these

concepts. Relate abstract concepts in biology to real-world examples on a regular basis, and make biology concepts relevant by presenting problems in a real-life context. Develop lifelong science-learning competencies. Introduce fewer concepts, but present them in greater depth. Stimulate the curiosity students have for learning about the natural world. Demonstrate both the passion scientists have for their discipline and their delight in sharing their understanding of the world with students.

2. **Focus on student-centered learning**
   Engage students as active participants, not passive recipients, in all undergraduate biology courses. Use multiple modes of instruction in addition to the traditional lecture. Ensure that undergraduate biology courses are active, outcome oriented, inquiry driven, and relevant. Facilitate student learning within a cooperative context. Introduce research experiences as an integral component of biology education for all students, regardless of major. Integrate multiple forms of assessment to track student learning. Give students ongoing, frequent, and multiple forms of feedback on their progress. View the assessment of course success as similar to scientific research, centered on the students involved, and apply the assessment data to improve and enhance the learning environment.
3. **Promote a campus-wide commitment to change**
   Mobilize all stakeholders, from students to administrators, to commit to improving the quality of undergraduate biology education. Support the development of a true community of scholars dedicated to advancing the life sciences and the science of teaching. Advocate for increased status, recognition, and rewards for innovation in teaching, student success, and other educational outcomes. Require graduate students in the biological sciences to participate in training in how to teach biology. Provide teaching support and training for all faculty, but especially postdoctoral fellows and early-career faculty, who are in their formative years as teachers.
4. **Engage the Biology community in the implementation of change**
   Promote more concept-oriented undergraduate biology courses, and help all students learn how to integrate facts into conceptual contexts. Ensure that all undergraduates have authentic opportunities to experience the processes, nature, and limits of science. Create active-learning environments for all students, even those in first-year biology courses. Encourage all biologists to move beyond the "depth versus breadth" debate. Less really is more.

ALC GOALS ESTABLISHED FOR DATA COLLECTION: Fall 2016 & Spring 2017

Academic Program: Biology
Person Responsible: Melanie Riedinger-Whitmore, Chairperson, Department of Biological Sciences

ALC GOALS ESTABLISHED FOR DATA COLLECTION: Fall 2016 & Spring 2017

Academic Program: Biology
Person Responsible: Melanie Riedinger-Whitmore

1. Content/Discipline Skills

Goals/Objectives	Means of Assessment/ Corroborating Evidence*	Criteria for Success	Findings	Plan for Use of Findings in Fall 2017 & Spring 2018
Demonstrate ability to discuss evolutionary processes and concepts	**PCB 4674 - Organic Evolution:** In class assignments that requires students to recognize and/or describe evolutionary concepts and processes	90% of students complete assignments with a minimum grade of 75%.	100% of students who attend complete in class assignments with a grade of 100%. And 87% of students completed the course with a minimum grade of 75%	Include more challenging assignments that are scored individually rather than as a group completion assignments.
Demonstrate understanding of cell structure, function of cell components, and cellular processes.	**BSC 2010 – Bio I – Cell Processes** In class assignments that requires students to identify components of the cell and the function of these components, and/or to	90% of students complete assignments with a minimum grade of 75%.	85% of students completed 30 points total of class assignments with a minimum grade of 75%.	Increase the number of class assignments to assess more key cellular processes.

	describe key cellular processes **PCB 3023 – Cell Biology** In class assignments that requires students to discuss cellular features and processes at an advanced level. In class quizzes testing the concepts taught in class before an upcoming exam. Class assignments (done outside the class room) that tests them on applied knowledge on concepts learned in the class. In class group presentations on advanced level techniques and or new concepts or mechanisms at the cellular level	90% of students complete assignments with a minimum grade of 75%.	This criterion was met for some assignments. For other assignments, which were meant to be more challenging, percentages of students above the grade of 75% varied depending on the nature of the assignment.	It has been my experience that challenging the students in in-class assignments sets them up for a much successful performance on exams. I plan to continue providing assignment with different levels of difficulty to prepare students well for exams. I suggest decreasing the percentage of 90% of students into 70% of students or less who are required to score above 70%. I would make the criteria as follows: 70% of students complete assignments with a minimum grade of 70%. The reason is that if we require more than 90% of students to score more than 75% in in-class assignments, it can make it more difficult for instructors to challenge students and make them work to their full potential. In my experience, challenging students early on set them for success in exams (which weigh more for their final grades)
Ability to discuss the different levels of organismal diversity.	**BSC 2011 – Diversity** In class assessments relating to taxonomic classification and structural and functional	90% of students complete assignments with a minimum grade of 75%.	ALC data not available for 2016-2017. Main instructor did not submit data before leaving for another position at end of fall semester. New	Reinstate assessment of this content in 2017-2018.

	differences that are used to separate organisms into the different classification systems, and the evolutionary history of diversity		instructors did not include assessments for spring.	
Demonstrate understanding of genetics, and chromosomal and molecular inheritance	**PCB 3063 – Genetics** Completion of in class assessments on genes, and the processes of inheritance	90% of students complete these assignments with a minimum grade of 75%.	This course is taught each semester, with several sections/semester. Faculty used different assessment tools in their respective classes, but reported similar results. PCB3063.602F16: for in-class closed note quizzes (7) and written portion of midterm exam on inheritance, 39 of 45 students scored average of 75% or higher (86.7% of students). PCB3063.601S17: for in-class closed note quizzes (4) and written portion of midterm exam on inheritance 39 of 47 students scored average of 75% or higher (83.0% of students). PCB3063.602S17: for in-class closed note quizzes (4) and written portion of midterm exam on inheritance 36 of 47 students scored average of 75% or higher (76.6% of students). Combined: 114 out of 139 (82.0%) students completed assessments with total score of 75% or better. 96-98% of students	The assessment results indicate a significant increase year over year vs 2015-2016. Combined for my courses was 42% of students in that year vs. 82% this year, with exam score included as part of in-class assessment. Given the positive trend, effort will continue to emphasize in-class problem solving. Continue to use many quizzes

			completed selected quizzes above 75% and question sets are scored on completion	and assignments to encourage engagement. (JH)
Demonstrate understanding of principles of ecology at the population to ecosystem levels	**PCB 3043 – Principles of Ecology** Completion of in class assignments on key concepts in ecology	90% of students complete assignments with a minimum grade of 75%.	Between 83 and 95% of students completed five in class assignments with a minimum grade of 75%, depending on section.	Increase the number of in class assignments to include the assessment of more key concepts in ecology, increasing the complexity of some in-class assignments, and adding group components to others.

*Please include multiple assessments. For example: students perform well on classroom assignments, norm-referenced tests/surveys, and they get accepted to graduate school or are employed.

2. Communication Skills

Goals/Objectives	Means of Assessment/ Corroborating Evidence*	Criteria for Success	Findings	Plan for Use of Findings in Fall 2017 & Spring 2018
Demonstrate ability to accurately, clearly and succinctly communicate scientific concepts, interpretations and conclusions to peers	**BSC XXX – Senior Seminar in Biology** Student present oral presentations as part of the seminar course	90% of students complete assignments with a minimum grade of 75%	100 % of students completed 30 minute oral presentations on a topic in biology with a minimum grade of 75%.	Continue assessing students with oral presentations.
	BSC 3402L – Experimental Biology lab Students present poster presentation as part of the course	90% of students earn 75% or higher on their original research project (poster and presentation).	Experimental Biology: This course is taught to mastery. 99% of students met or exceeded the 75% grade for their final research projects.	No change. Students master this applied statistics course within the 15 week semester.

3. Critical Thinking Skills

Goals/Objectives	Means of Assessment/ Corroborating Evidence*	Criteria for Success	Findings	Plan for Use of Findings in Fall 2017 & Spring 2018
Ability to apply the process of science in designing original research	**BSC 4910 -Undergraduate Research** Students complete original research project that involves determining research question, experimental design, data analysis and interpretation	90% of students will complete research project with a satisfactory grade	11 Biology majors completed this course in Fall 2016 and 20 completed it in spring 2017. 100% of students met or exceeded the criteria for success. For some students, the project included a research or review paper, or a poster presentation.	Students did an impressive job on their research this year. I will continue to require that students complete a research poster for the Symposium based on the research projects. Three of the nine students are working on manuscripts for publication. Review paper, research paper or poster projects will be used in future undergraduate research sections.
	PCB 3043L – Ecology Students complete original research project as part of class that involves determining research question(s), experimental design, data analysis and interpretation	Students complete or group research poster presentation; 90% earning grade of 75% or higher.	95% of students completed research poster presentations with a minimum grade of 75%.	Continue assessing students with poster presentations, but add additional instructions to help students better communicate content.
Ability to use quantitative reasoning: Apply quantitative analysis to interpret biological data	**BSC 3402L – Experimental Biology lab** Students complete projects that require data analysis and interpretation	90% of students complete assignments with a minimum grade of 75%	99% of students met or exceeded a 75% grade on their weekly research summaries.	No change. The research summaries include a title, hypotheses, 3 descriptive statistics, 3 comparative tests and an interpretation on practice data files.

"… to ensure student achievement in undergraduate and graduate degree programs …"

4. Civic Engagement

Goals/Objectives	Means of Assessment/ Corroborating Evidence*	Criteria for Success	Findings	Plan for Use of Findings in Fall 2017 & Spring 2018
Demonstrate engagement with community partners	**BSC 4940 – Biology Internship** Students will complete internship in the community Active membership in one of our Biology student organizations	90% of students completing internship will have reference letters that are positive and will receive a grade of satisfactory 50% of our majors will be a member of a Biology student organization 90% of students completing internship will write a review paper on a topic of interest about the internship 120 logged hours during internship. 90% have positive reviews from supervisors and complete an experience synthesis paper with satisfactory grade 50% of our majors will be a member of a Biology student organization (DJ)	21 students completed internships in the fall semester, and 21 students completed them in spring. Almost 100% of students completed an end-of-semester report detailing their internship experiences, logged 120 hours, and had positive reference letters. Only one student did not. There were 143 active members in the USFSP Pre-Med club, however, we do not have a cross listing of how many of those members are USFSP Biology majors.	Faculty comments: No change. I enjoy reading these reports which include a journal of experiences. Surgeries and tooth extractions make particularly interesting reading! So did the elephant sperm collection by a student interning at Lowry Park Zoo. Continue assessing students with review papers. Continue assessing students with logged hours of internship. The program will continue, although gradually the Career Center and College of Arts and Sciences internship coordinator will become more involved with internships. As the number of Biology majors has grown, it has become harder for us to keep track of active membership in biology-related organizations. There has also been an increase in the total number of student organizations on campus, many are cross-disciplinary,and attract students from many different majors. We'll like add a

				survey for our students during 2017-2018, so we can better track membership.

5. Multiculturalism / Diversity

Goals/Objectives	Means of Assessment/ Corroborating Evidence*	Criteria for Success	Findings	Plan for Use of Findings in Fall 2017 & Spring 2018
Ability to understand the relationship between science and society: Identify social and historical dimensions of biology practice	**BSC XXXX – Senior Seminar in Biology** Students present essays that address relationship between science and society	90% of students complete assignments with a minimum grade of 75%	100 % of students wrote 10 page review papers on a topic in biology with a minimum grade of 75%.	Continue assessing students with review papers.

ALC GOALS ESTABLISHED FOR DATA COLLECTION: Fall 2017 & Spring 2018

1. Content/Discipline Skills

	Means of Assessment/			Plan for Use of Findings in

"… to ensure student achievement in undergraduate and graduate degree programs …"

Goals/Objectives	Corroborating Evidence*	Criteria for Success	Findings	Fall 2017- Spring 2018

*Please include multiple assessments. For example: students perform well on classroom assignments, norm-referenced tests/surveys, and they get accepted to graduate school or are employed.

2. Communication Skills

Goals/Objectives	Means of Assessment/ Corroborating Evidence*	Criteria for Success	Findings	Plan for Use of Findings in Fall 2017- Spring 2018
	BSC 3402L – Experimental Biology lab Students present research posters at the Annual Symposium as part of the course. (DEBY)	90% of students earn 75% or higher on their original research project (poster and presentation). (DEBY)		

3. Critical Thinking Skills

Goals/Objectives	Means of Assessment/ Corroborating Evidence*	Criteria for Success	Findings	Plan for Use of Findings in Fall 2017- Spring 2018
	BSC 4910 -Undergraduate Research Students complete original research project that involves determining research question, experimental design, data analysis and interpretation (CASSILL)	90% of students will complete research project with a satisfactory grade (DEBY)		
	BSC 3402L – Experimental Biology lab Students complete projects that require data analysis and interpretation (CASSILL)	90% of students complete assignments with a minimum grade of 75% (DEBY)		

4. Civic Engagement

Goals/Objectives	Means of Assessment/ Corroborating Evidence*	Criteria for Success	Findings	Plan for Use of Findings in Fall 2017- Spring 2018
	BSC 4940 – Biology Internship Students will complete internship in the community Active membership in one of our Biology student organizations (DEBY)	90% of students completing internship will have reference letters that are positive and will receive a grade of satisfactory 50% of our majors will be a member of a Biology student organization (DEBY)		

5. Multiculturalism / Diversity

Goals/Objectives	Means of Assessment/ Corroborating Evidence*	Criteria for Success	Findings	Plan for Use of Findings in Fall 2017- Spring 2018